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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/631,941	08/03/2000	Dug In Lyu	K-200	9312

7590 08/06/2004

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EXAMINER	
VOLPER, THOMAS E	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/631,941	LYU, DUG IN	
	Examiner	Art Unit	
	Thomas Volper	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 17 May 2004 have been fully considered but they are not persuasive.

In response to Applicant's arguments regarding claims 1, 3 and 11, that McDonough (US 6,519,237) in no way suggests differently deciding each transmission starting point (of the each physical channel) if the non-orthogonality is determined to exist among the physical channels, and that Zehavi (US 6,044,074) does not relate to the technical features of independent claim 1, the Examiner respectfully disagrees. As cited in the previous Office action, Ovesjo discloses using different non-orthogonal scrambling codes for downlink communication from a base station to mobile stations in different sectors of a cell (col. 7, line 1 – col. 8, line 46). Thus, it is determined that those mobile stations in different sectors from each other are receiving downlink communications from the base station that are non-orthogonal to each other. As also mentioned in the previous Office action, Ovesjo does not disclose different starting points for scrambling codes of non-orthogonal physical channels. McDonough and Zehavi, taken together, cure this deficiency by rendering obvious a phase-shifted PN code for non-orthogonal channels. McDonough discloses that a PN code can be phase-shifted to distinguish itself from a pilot PN code being propagated from another base station (col. 2, lines 13-54). Zehavi provides disclosure that a PN code is in fact a scrambling code, which provides the basis for combining McDonough with Ovesjo, and that a PN code can be shared by either users of the same base station, or sectors, i.e. beams, within a particular base station (col. 2, lines 16-29). Thus, taken

together it is obvious that mobile users within a particular sector of a cell may share a particular phase-shifted PN scrambling code. It is obvious to combine this phase-shifted PN scrambling code with the invention of Ovesjo so that a mobile station would know in which sector it was communicating, thus reducing the interference among sectors.

In response to Applicant's argument regarding claim 4, that the cited combination fails to teach or suggest differently deciding chip transmission starting points of a plurality of physical channels, the Examiner respectfully disagrees. As described above, the cited combination does provide for physical channels that are non-orthogonal to have PN scrambling codes with different starting points. In the broadest reasonable interpretation of claim 4, this meets the limitation of differently deciding chip transmission starting points of a plurality of physical channels.

In response to Applicant's argument that claims 5-10 and 12 are now patentable due to the same reasoning applied to the independent claims 1, 3 and 11, the Examiner respectfully disagrees. As stated above, Applicant's arguments regarding claims 1, 3, and 11 have not overcome the 35 U.S.C. 103(a) rejection of the previous Office action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 4, 10-15, 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovesjo et al. (US 6,542,484) in view of McDonough et al. (US 6,519,237) and Zehavi et al. (US 6,044,074).

Regarding claims 1, 3, 4, 11, 13, 15, and 20-24, Ovesjo discloses using different non-orthogonal scrambling codes for downlink communication from a base station to mobile stations in different sectors of a cell (col. 7, line 1 – col. 8, line 46; see also Figures 7a-7c). All users within a particular code set use the same scrambling code, and thus are orthogonal to each other. However, the users in one code set are non-orthogonal to users in an adjacent code set. Ovesjo fails to expressly disclose that each non-orthogonal physical channel has a different starting point. McDonough discloses shifting the starting points of pseudonoise (PN) sequence in the downlink signal of several base stations (col. 2, line 66 – col. 3, line 14; see also Figure 1b). McDonough does not explicitly disclose shifting the starting points of scrambling codes, however, Zehavi et al. discloses that PN spreading codes are typically shared by all communication signals in a cell, beam, or sub-beam (col. 2, lines 16-29). In this functionality described by Zehavi, it is clear that PN spreading codes are being used as scrambling codes, according to the definition of scrambling codes set forth in the present invention. McDonough, in light of Zehavi, discloses the possibility of shifting the starting points of scrambling codes. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to offset the scrambling codes of different code sets in the invention of Ovesjo so that the non-orthogonal scrambling codes would have different starting points. One of ordinary skill in the art would have been motivated to do this to further reduce interference between code sets.

Regarding claims 10, 19 and 25, Ovesjo fails to expressly disclose different starting points for each scrambling code wherein the time interval between each of the starting points is a reciprocal of the number of scrambling codes. McDonough discloses a circular diagram of PN code phase shifts that shows 512 possible phase shifts (see Figure 1a). The phase shifts between each PN code starting point is 64 bits, thus the phase shifts are equally spaced (col. 2, lines 13-33). Since the shifts are equally spaced in the circular diagram, the time interval of a phase shift must be equal to the reciprocal of the number of phase shifts representing different scrambling codes. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to equally space phase shifts in time for each of the scrambling codes used in the invention of Ovesjo. One of ordinary skill in the art would have been motivated to do this so as to reduce interference among scrambling codes evenly within the cell.

Regarding claim 12, McDonough discloses that in a system using PN code phase shifts, a mobile station checks all phase shifts and attempts to correlate them to a received input signal (col. 2, lines 34-54).

Regarding claim 14, Ovesjo discloses that the available frequency bandwidth can be completely reused in different code sets (col. 2, lines 5–35). Thus, a physical channel that is non-orthogonal to another physical channel because they exist in different sectors of the cell may be transmitted within the same frequency bandwidth.

4. Claims 5, 6, 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovesjo et al. (US 6,542,484) in view of McDonough et al. (US 6,519,237) and Zehavi et al. (US

6,044,074) as applied to claims 1-4 and 10-12 above, and further in view of Teidemann, Jr. et al. (US 5,509,035).

Regarding claims 5, 16 and 26, the teaching provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. fails to expressly disclose that a value for the PN code shifts are chosen to minimize mutual interference. Teidemann discloses that PN code phase offsets are designated to allow a base station to communicate with a mobile station with minimal interference (col. 5, lines 58-67). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to designate PN code offsets that created minimal interference among the non-orthogonal users in the system provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. One of ordinary skill in the art would have been motivated to do this in order to create a more efficient communication system.

Regarding claim 6, Ovesjo discloses that a cell may contain different numbers of code sets, each using different scrambling codes (see Figures 7a and 7b). It is well known in the art that the base station must transmit each scrambling code with greater power with respect to Figure 7a, than in Figure 7b. Since the base station transmits only two different scrambling codes in 7a, each corresponding to half the cell area, as compared to three scrambling codes in Figure 7b, each corresponding to a third of the cell area, more power must be designated for each scrambling code in Figure 7a to cover the greater amount of cell area, as compared to Figure 7b. In addition, McDonough et al. provides for equal spacing of the phase shift intervals (see Figure 1a). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use equally spaced phase shift intervals, thus directly relating greater cell power per scrambling code to greater phase shift intervals between phases of different scrambling

codes. One of ordinary skill in the art would have been motivated to contribute the use of the equal spacing of McDonough to system provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. thus far in order to reduce interference among scrambling codes evenly within the cell.

5. Claims 7-9, 17, 18 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovesjo et al. (US 6,542,484) in view of McDonough et al. (US 6,519,237) and Zehavi et al. (US 6,044,074) as applied to claims 1-4 and 10-12 above, and further in view of O (US 6,061,338).

Regarding claims 7, 9, 17, 18 and 27, the system provided by Ovesjo et al. in view of McDonough etal. and Zehavi et al. fails to expressly discloses that the time interval of a phase shift corresponds to half a chip duration. O discloses a CDMA system in which a spread code generator may shift the phase of a spread code by half a chip (col. 6, lines 21-34). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to designate the phase shift of the scrambling codes in the system provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. to be half a chip duration. One of ordinary skill in the art would have been motivated to do this to quickly correlate a mobile station to the proper scrambling code.

Regarding claim 8, it is an inherent property of the chip speed that the chip duration, or period, is a reciprocal of the chip speed.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication, or earlier communications from the examiner should be directed to Thomas Volper whose telephone number is 703-305-8405 and fax number is 703-746-9467. The examiner can normally be reached between 8:30am and 6:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached at 703-308-6602. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Thomas E. Volper

TEV

August 4, 2004

ALPUS H. HSU
PRIMARY EXAMINER